Garden City Summit

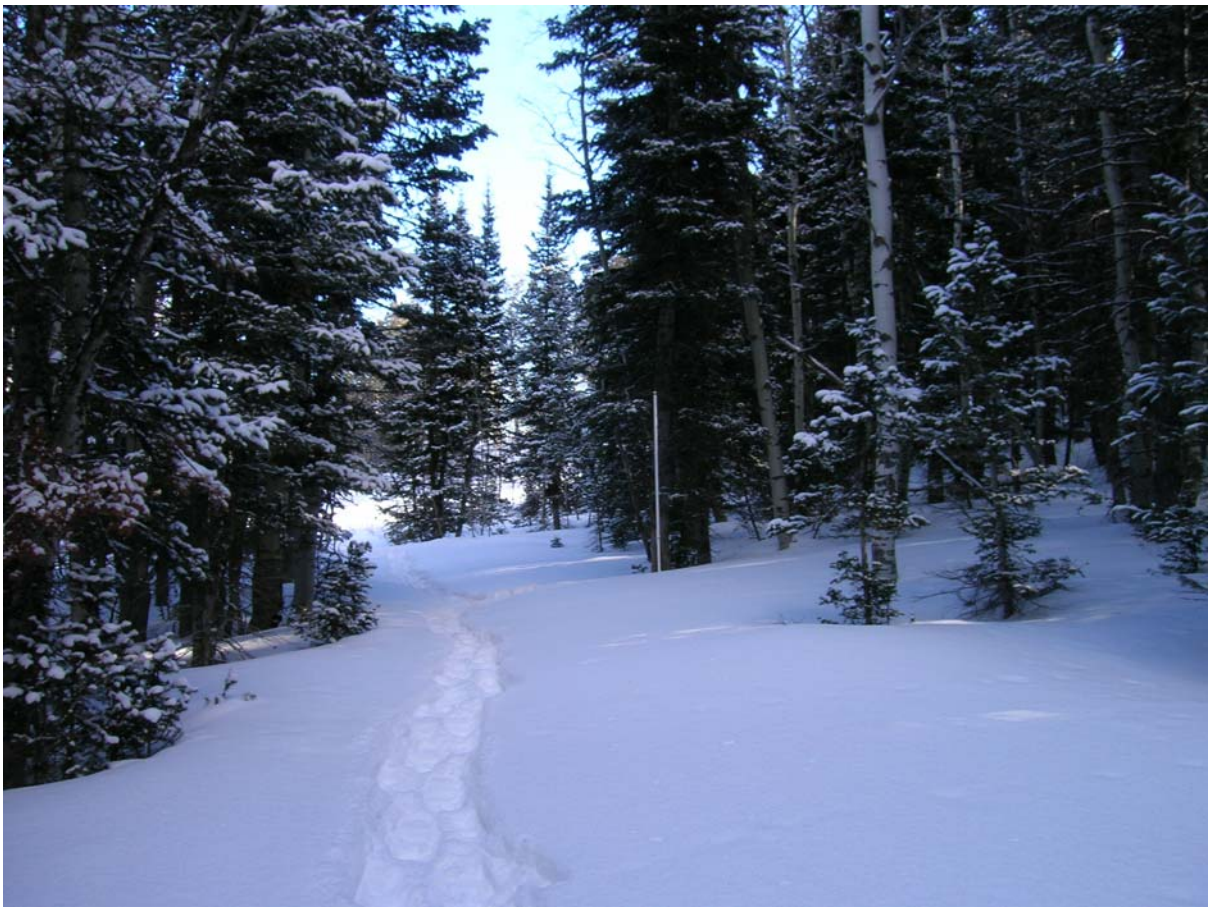
The Garden City Summit snow course is located near the watershed divide of the Logan River and Bear Lake at an elevation of 7600 feet msl. The course is in a small drainage physically cut off by highway 89 about 100 yards to the north/northeast. This course has been dramatically altered by vegetation change. At one time it was along a narrow road directly in the bottom of a small drainage with primarily aspen vegetation. It is now predominately dense conifer cover with the trees close enough that some sample points are being influenced by interception and melt rings produced from long wave radiation off the trees. Potential weather modification: 89-

This photo from 1936 is looking up the drainage to the south southwest. To the bottom right is the fill base, from the beginning of highway 89 from Logan to Bear Lake. The course begins about halfway from the individual in the photo to the aspens in the upper left. Notice the prevalence of aspens in the photo with some individual conifers on the upper right and one tongue of conifers in the upper left.

This photo is from the top of the course looking north – northeast, shows the aspens in the bottom of the canyon and the single tongue of conifer coming from the east (right).

The following photos was taken during the March 2007 survey. They show a sharp contrast in vegetation from the previous photos.

This aerial photo shows the once predominant aspen cover has been completely replaced by dense conifer cover. The course runs up the center of the drainage and near the snowshoe tracks visible along the bottom left of the photo. Accumulation and ablation characteristics have been altered by this change in vegetation.



Sample number 1 looking north at the beginning of the course.

Looking northwest west through the least dense part of the conifers.

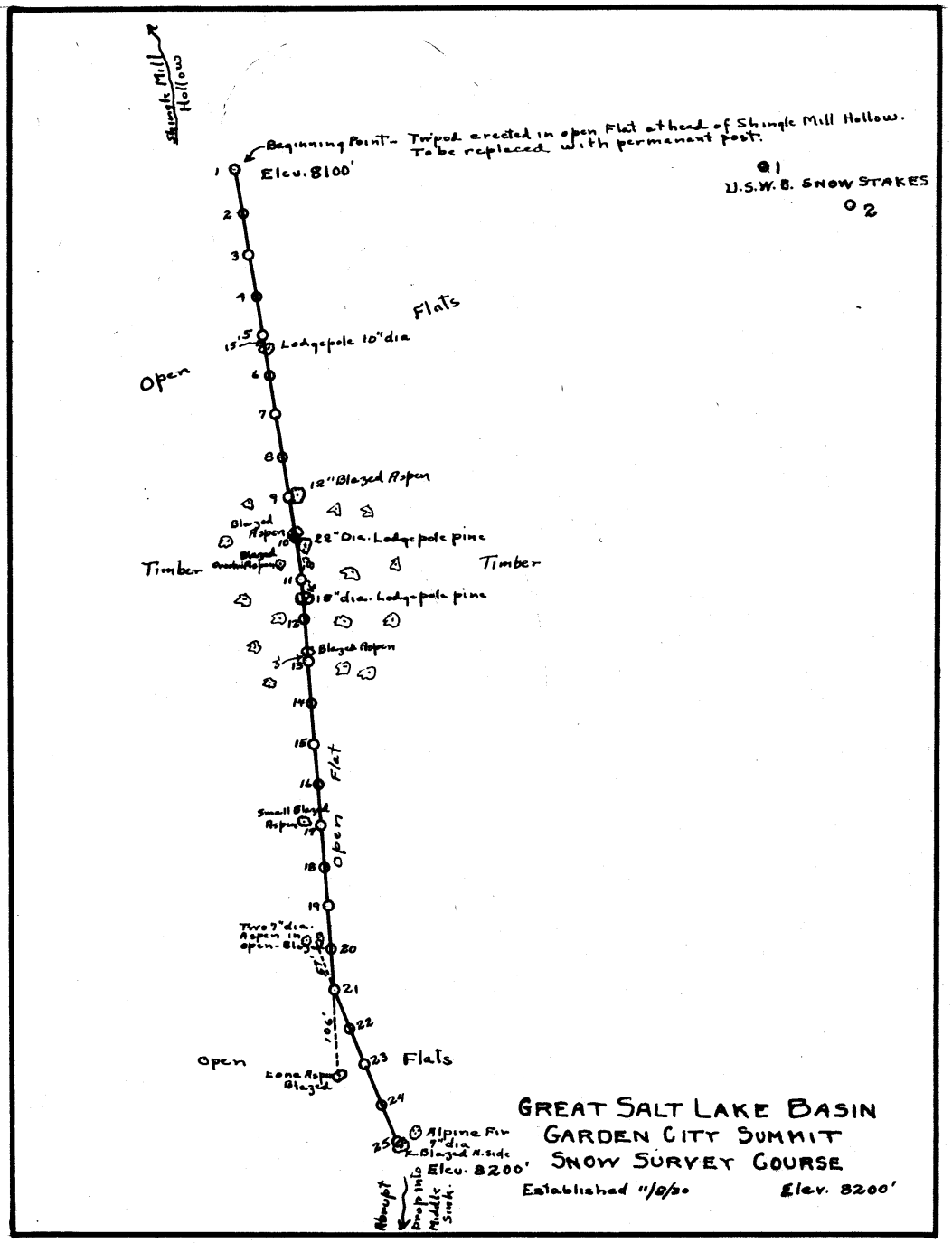
Looking south southwest along the course, notice the close proximity of the conifers to the sample markers.

Looking up the hill to the southeast into a more dense portion of the conifers.

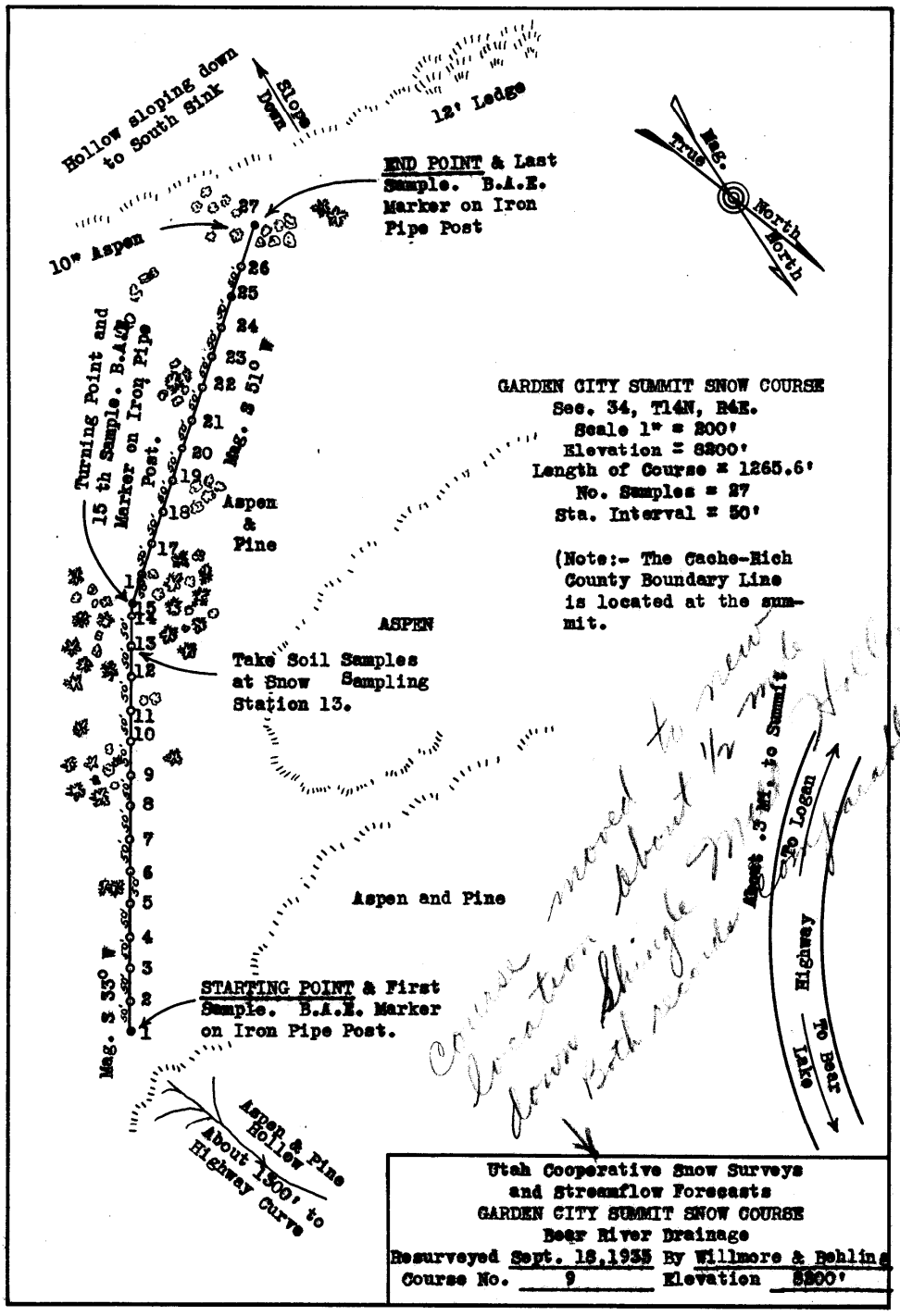
This photo from about 2004 displays the clear impacts of the current conifer overstory on the course. Note the melt rings around various trees and the undulating snow surface where deposition has been altered by conifer crowns.

Melt rings near and at sample points. In the early 2000 time frame, several large conifers that were physically impacting sample points at the end of the course were removed. It is likely that these sample points will be accumulating more snow currently than in previous records.

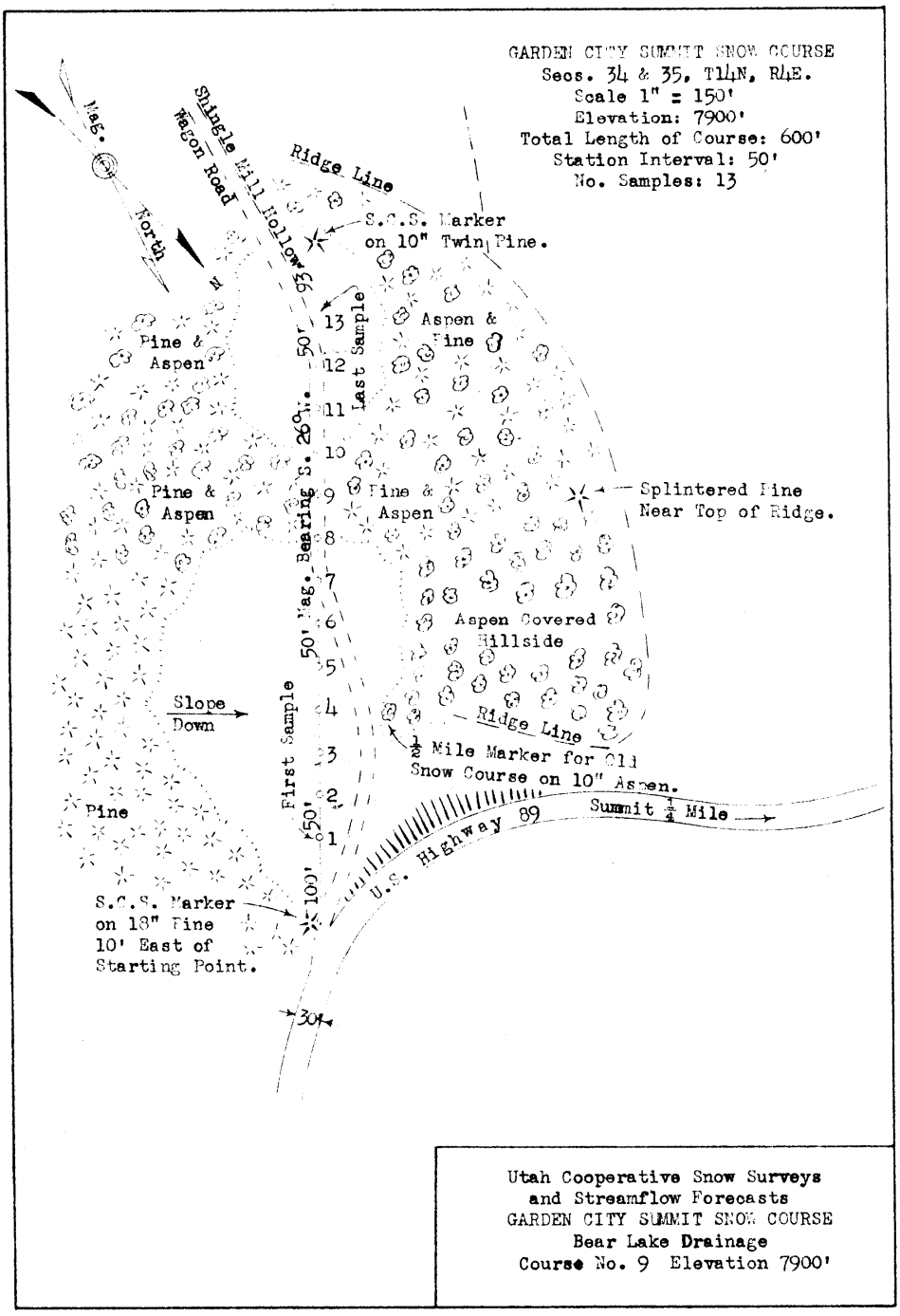
The vegetation is not the only change that has occurred at this site over time, the course has been moved, shortened, and renumbered since its establishment in the 1930's. The following maps show the progression of the course throughout its history.



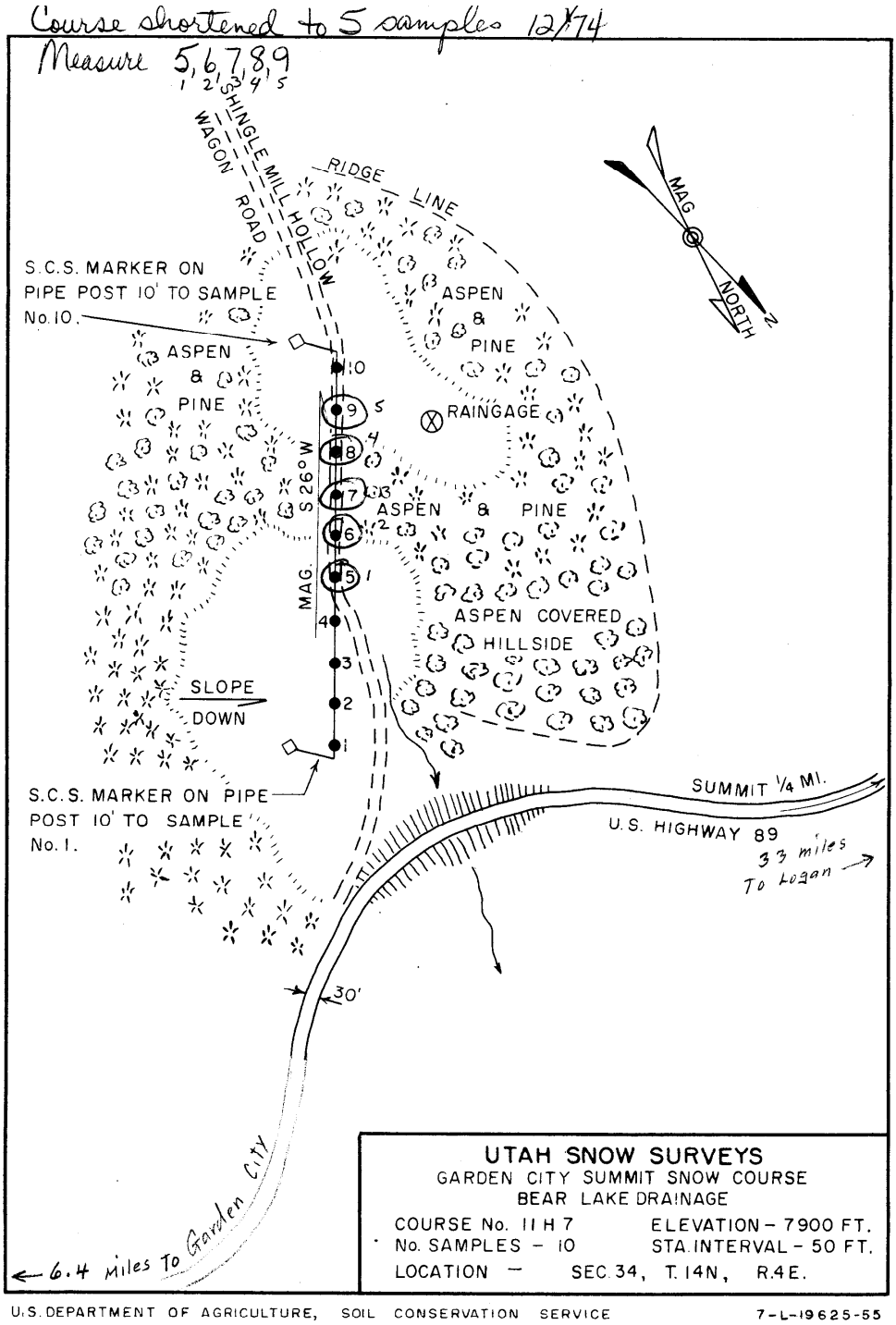

Original Garden City Summit snow course Map.




Course moved closer to highway.

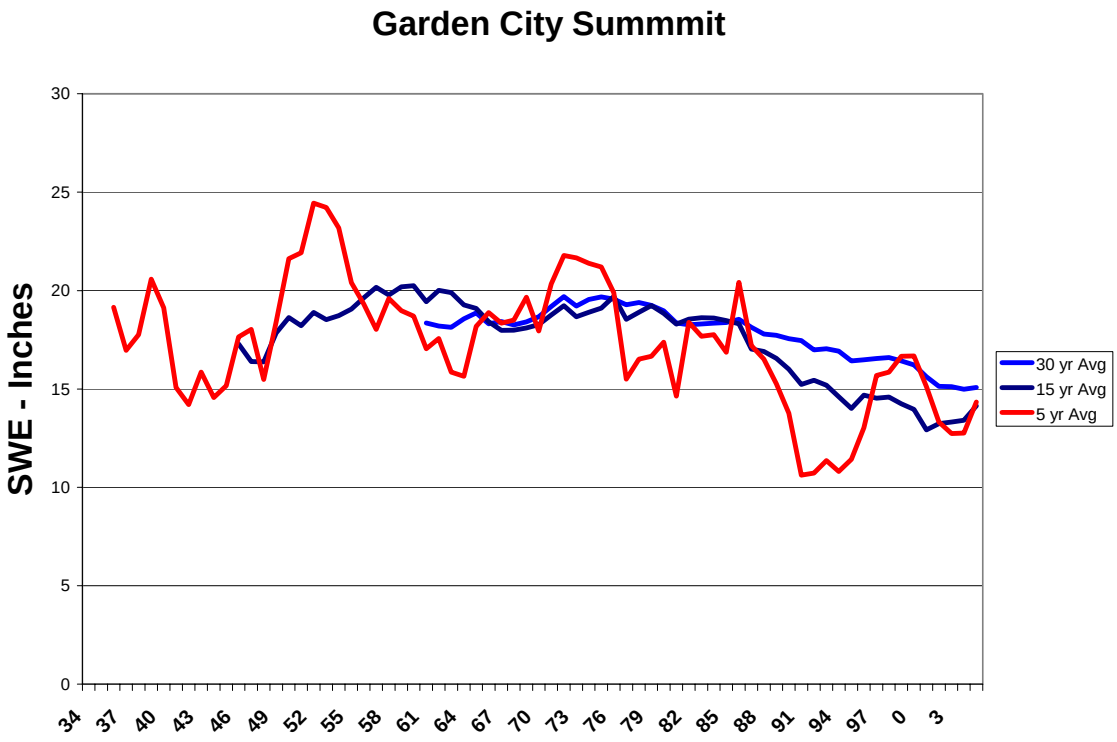



New course with 13 sample points. Note the open meadow conditions from samples 1 to 8 and 11 to 13.




Current course configuration with 5 sample points as of 1974. At some point between this map and the previous one, the course was shortened from thirteen points to ten.

When a snow course was shortened, the original points continued to be measured although they were renumbered, thus points 1,2,3,4 and 5 may have originally been points 13,14,15,16 and 17. These maps also show the relative position of vegetation and other features with respect to the course. Distances are not measured and asterisks do not represent individual trees rather a general depiction of vegetation. The density of vegetation is also relative and not absolute.




There is clear evidence in this chart of April 1 swe that this site has been getting less snow over time, from a 30 year average high of nearly 20 inches in the mid 70's to nearly 15 inches in later years. The decline has been relatively steady since the early 50's on all traces: 5, 15 and 30 year running averages. Given the extent and type of vegetation change as well as the magnitude of decline (25%) most, if not all, of this decline could be attributed to these site changes. There have always been some trees near this snow course, in the early days it was primarily aspens that have now almost been completely replaced by dense conifer cover. A decline of 25% seems to be in line with other research and observations. This site should not be used in long term comparisons without data adjustment to compensate for vegetation and other potential changes.

R Julander
2007